Endangered Plants

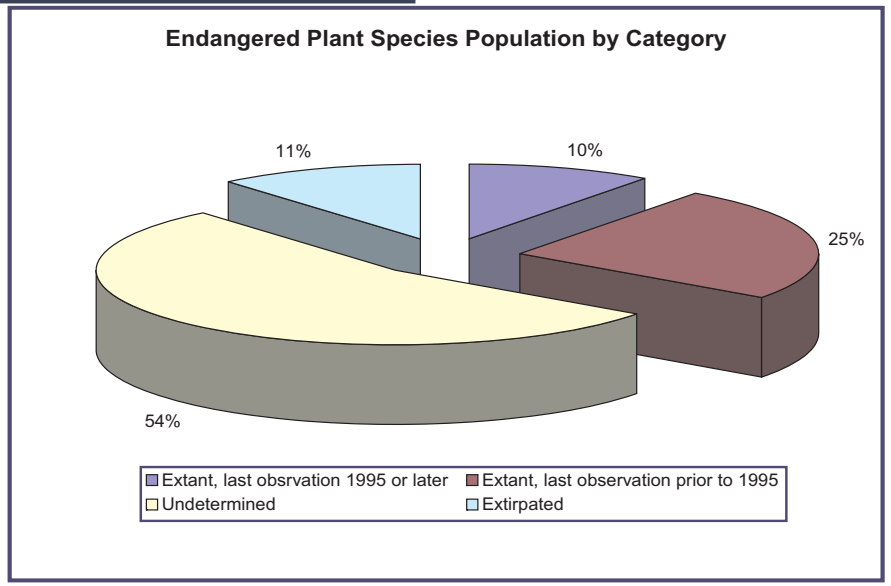
Background

The native flora of New Jersey is an important component of its biological diversity, which is continually diminished as species, populations and habitats are lost from the state. Fifteen percent of New Jersey's native flora, which comprises more than 2100 species, is currently classified as endangered. In New Jersey, an endangered plant species is one whose survival within the State or nation is in jeopardy.

New Jersey has a surprisingly high concentration of native plant and animal species relative to other states. Its native flora has representatives of more than 50% of the plant species found in the Northeast from Pennsylvania to Maine, despite the fact that it contains a mere 5% of the total land area of the region. Similarly, according to the 2000 US Census, although it amounts to less than 0.26% of the total land area in the United States, and is the fourth smallest state in the nation, approximately 13% of the plant species in the US can be found in New Jersey.

In large part, this high diversity is due to the variety of habitats and landscapes. New Jersey is comprised of five physiographic regions: the Outer Coastal Plain, the Inner Coastal Plain, the Piedmont, the Highlands and the Ridge and Valley. These regions have distinct combinations of geologic, topographical and hydrologic features, which give rise to a wide range of environmental conditions, and a tremendous botanical diversity.

The habitats and conditions that foster this diversity are themselves the cumu lative result of natural processes that have been taking place for millions of years, and for this reason the current distribution of many species is closely tied to the geological history of the region. The ranges of many northern and southern species also converge in New Jersey, oftentimes reaching their geographic limit in the state. Species such as the snowy orchid (Platanthera nivea) and seabeach evening primrose (Oenothera humifusa), are more typical of the southern flora, but reach as far north as Cape May and Ocean Counties. Similarly, the ranges of northern species such as yellow-eyed grass (Xyris montana) have been found to extend as far south as the northern reaches of the state. Although these species are often less abundant in New Jersey than in the more central portions of their respective ranges, many have unique morphological or genetic characteristics due to their long-standing exposure to the unique set of environmental conditions present here.



Extant, extirpated, and undetermines endangered plant species populations in the Natural Heritage Database.

Endangered plants are defined as native New Jersey plant species or subspecies whose survival in the state or nation is in jeopardy, including but not limited to plant species listed or proposed as endangered or threatened by the Federal government under the Endangered Species Act of 1973, any additional species known or believed to be rare throughout its worldwide range, and any species having five or fewer extant populations within the state (N.J.S.A. 13:1B-15.1512 et seq.). An extant population is one that still exists in the wild. Those species that are no longer found in a certain geographic area, but which are not globally extinct, are referred to as extirpated. The primary source of information regarding such species in New Jersey is the Natural Heritage Database, which contains recent information on the taxonomy, rarity, threats, protection, location, and population data for all endangered plant species, plant species of concern, and extirpated plant species in New Jersey.

Status

The Natural Heritage Database currently tracks the status of 802 rare plant species, or 38% of the State's flora. Of these, 339 vascular and non-vascular plants, or 16%, are officially listed as state endangered. With a few excep-

tions, state endangered plants are known from five or fewer extant populations in NJ. Thirty endangered plant species are known from only a single location statewide, and four plant species are endemic to NJ (i.e., found nowhere else in the world).

Examples include American chaffseed (Schwalbea americana), once known from 18 NJ locations and now restricted to a single extant population precariously located on a roadside in Brendan T. Byrne State Forest, Burlington County. This is also the only known population north of the Carolinas, and what remains of the species' northern genotype, which formerly extended to Massachusetts. Some formerly extant populations were lost through the widening of roads. Hammond's yellow spring beauty (Claytonia virginica var. hammondiae) is known worldwide from a single acidic freshwater seepage swamp in Sussex County and is threatened by a Eurasian invasive plant also restricted to this plant's unique habitat. By contrast, bog asphodel (Narthecium americanum), while also endemic to NJ, enjoys 43 populations in the core of the NJ Pinelands and may be locally abundant in its globally rare streamside savanna wetland habitat.

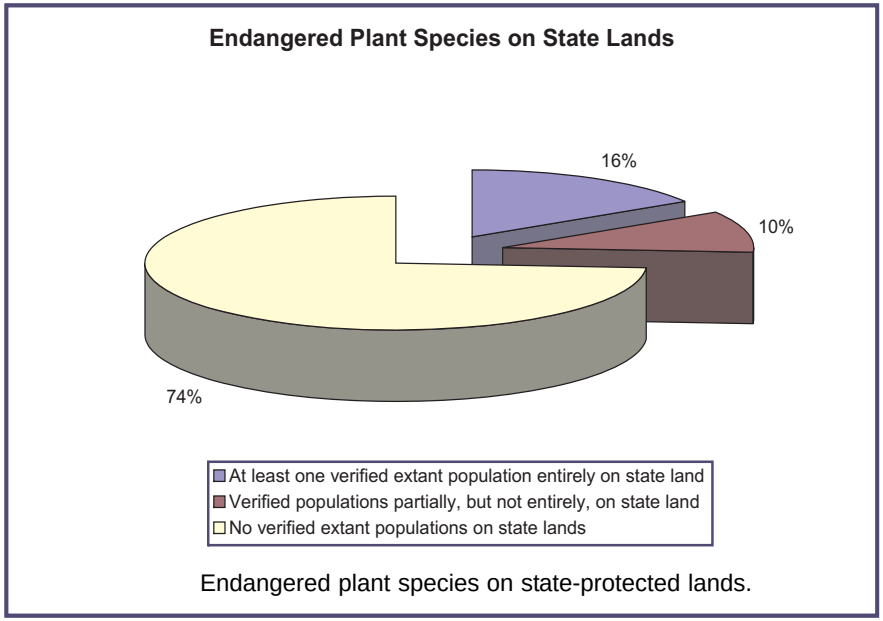
Habitat loss or destruction through development is widely acknowledged to be the leading cause of species extinction and endangerment both in the nation and worldwide. Following these national and global trends, development and urbanization have been the major threats to endangered plant populations in New Jersey. In addition, New Jersey has been affected to an even greater degree than is typically found elsewhere, which is likely due to a longer history and greater intensity of development activities in New Jersey in comparison to other states, and a much higher human population density. The proliferation of invasive nonindigenous plant species, while not tracked by the Department, is undoubtedly resulting in significant impacts to rare plant populations, and this threat is expected to increase in the future.

There are a number of other factors that affect plant populations in New Jersey. Changes in the fire regime, flooding patterns, or depth of the water table can have profound affects on populations. Some species occur only in open habitats, and events such as fires or floods suppress the growth of trees and shrubs that would otherwise come to dominate the sites. Once these changes take place, especially in places like the Pinelands, the conditions necessary to prevent the growth of woody species are severely affected, resulting in the loss of populations.

Intensive management, use, or development of recreation areas such as beaches, boat launches, parks, campgrounds, and parking areas often threaten to destroy endangered plant populations. Recreational activities such as off-road vehicular traffic, as well as the management of land for these purposes, are common threats to endangered plant species occurrences, as are pollution and water-related activities.

The construction and maintenance of roadways is another frequently documented threat to endangered plant populations across the state. Over 118 populations of 60 different threatened and endangered species were found to occur along roadways in New Jersey. Together with railroads, highways, right-of-ways and bridges, these transportation corridors can, in fact, provide habitat for native species that require open areas. The construction, widening and/or maintenance of these corridors can severely threaten endangered plant species populations occurring there.

The Endangered Plant Species Population by Category figure shows the status of plant populations based on NJDEP's Natural Heritage Database in



Endangered plant species on state-protected lands.

1998. Among the 331 state endangered vascular plant species, 778 populations were verified as extant, 10% of which have been verified since 1995. A total of 295 (11%) populations were reported to have been extirpated, among 132 species. The status of 54% percent were undetermined.

Extant, extirpated, and undetermined endangered plant species populations in the Natural Heritage Database.

The majority of species that have been verified as extant since 1980, however, have only three or fewer populations. This is extremely significant in that the risk of extinction tends to increase with smaller population size and number of populations. This risk is even greater given that the majority of these extant species, approximately 74%, had no populations on state lands (See Endangered Plant Species on State Lands Figure). Only 16% had at least one verified extant population entirely on state land, where populations might be protected and secured, and 10% had verified extant populations partially, but not entirely, on state land.

Outlook and Implications

Our natural heritage is diminished w hen elements of biological diversity are lost from the state, regardless of whether it is in the form of an entire species, the individual populations of which they are comprised, or the habitats, communities and ecosystems of which they are a part. This diversity provides us with a wealth of economic, aesthetic, cultural, and other goods, and represents a tangible connection to our evolutionary past, and to the greater community of life that we are not only a part of, but are utterly dependent upon.

Habitat destruction and degradation has been, and continues to be, the greatest threat to endangered plant species in New Jersey, the nation, and worldwide. The protection, monitoring, and management of the habitats where these populations occur is widely recognized as the best, and oftentimes the only, way of ensuring the survival of endangered plant species, and therefore must be a priority. The preservation of open space is extremely important for the protection of endangered species, however, currently, only 26% of the extant species in New Jersey have populations either wholly or partially located on state-protected lands. More endangered species habitat must be protected in order to ensure the survival of these species in the future. In addition to selecting priority sites, it is important to not only seek protection for the greatest number of populations, but to ensure that representative populations of each endangered plant species are included in these measures.

Furthermore, attention must be given not merely to particular areas where plant populations occur, but to adjacent and other sites as well, if both the habitats and the associated ecological systems that maintain them are to be adequately protected. The amount of land actually occupied by a particular population may be very small, whereas the ecological processes that they depend upon, such as pollination and dispersal, often extend well beyond these boundaries. Consequently, changes in the forest structure, water table, or other aspects in adjacent areas may be detrimental to these populations as well.

While the protection of habitats is necessary for the survival of these species, it is not necessarily sufficient to achieve this purpose in all cases. Significant natural and man-made changes may occur even after the locations have been protected, as has been witnessed in a number of Nationa l Parks. Site-specific monitoring information, along with an understanding of the biology of each species, is therefore of great importance for the subsequent management and maintenance of many of these populations. The availability and adequacy of such information needs to be assessed as well.

This chapter, and the report on which this chapter is based, provides a baseline status of endangered plants. Further studies and the development of additional indicators are needed in order to track the populations of these species and help develop measures to ensure their continued existence in the State.

More Information

http://www.nj.gov/dep/parksandforests/natural/heritage/
http://www.natureserve.org/getData/plantData.jsp
http://www.centerforplantconservation.org/NC_Choice.html

References

Much of the information in this report was provided by the NJDEP Natural and Historic Resources Group, Office of Natural Lands Management's Report "Endangered Plant Species Populations in New Jersey: Health and Threats" 2006. This report can be accessed at http://www.state.nj.us/dep/dsr/plant .